REMARKS

Applicant affirms election of product claims 1-9. Non-elected claims 10-20 have been cancelled without prejudice, and new dependent product claims 21-22 have been added.

Claim 1 has been amended to include the subject matter of claim 2. The claim as amended recites a "body having a porous surface of greater porosity than an underlying matrix of the body, the porous surface comprising a plurality of recesses including smaller recess and larger recesses, the larger recesses each being substantially spherical and having a small ball of solid electrolyte at its bottom, the first electrode substantially covering the first side of the body, the first electrode comprising a thin layer of conductive catalytic material extending into the larger and smaller recesses to mechanically lock the layer to the porous surface." This structure results from the collapse of the spray-dried balls in the preferred coating of the present invention. Nothing in the prior art suggests such a structure.

The process which creates the structure as claimed is set out in detail in the specification:

> The compact is then dipped in an alcohol slurry of stabilized zirconia powder and spray-dried stabilized zirconia granules to deposit a coating about fifty microns thick. Page 10, lines 5-7.

The powder is illustratively made of $< 1\ \mu$ particles, and the granules are illustratively spray dried 200-250 mesh granules. The coating and firing process are described. The specification then says:

> The firing process burns off the acrylic binder and reduces the dimensions of the thimble by about twenty-five percent. The resulting thimble has a body which is smooth, dense and nonporous, covered with an external coating 55 which is highly porous. The coating is chemically bonded to

the body. If the body were formed entirely of the coating, it would be worthless as a solid electrolyte for an oxygen sensor, because it would conduct air. In the firing process, the spray-dried granules in the coating shrink away from the matrix forming the coating and form spherical voids 57 in the matrix, with the densified granules bonded to their interiors. These spherical voids play an important part in the plating process as described hereinafter. The porous coating also includes many smaller voids which likewise play an important role in the plating process. Page 11, lines 1-11.

...

The electroless plating process provides coatings of great uniformity. As shown in FIG. 3, unlike the results of painting a thick film ink onto the surface or sputtering a film onto the surface, the plated film extends into the pores of the porous coating, including the spherical openings produced by the densified granules in the coating. The platinum film is thus locked into the pores and cannot be peeled from the surface of the thimble. Page 13, lines 4-7.

Nothing in the prior art shows or suggests the structure now set out in claim 1.

The claim was rejected as anticipated by Katafuchi et al. 5,948,225 or Japan 4-95766. Katafuchi et al. disclose nothing about forming large and small openings of the types called for in claim 1 in the surface of their sensor. As set out above, Katafuchi et al.'s sensor is **not** made in the same manner as applicant's sensor, and nothing in Katafuchi et al.'s disclosure suggests that their sensor would have the structure called for in claim 1.

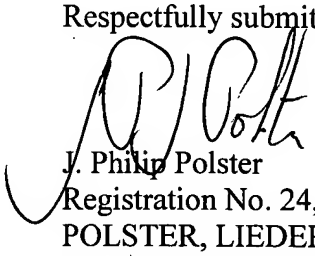
Applicants agree that, at least with respect to claim 1 of the present application, Japan 4-95766 is made by essentially the same process as that of Katafuchi et al. It may be noted that Katafuchi et al. carefully distinguish the method of this published application from theirs, but neither method would produce the structure called for in claim 1.

The claim was also rejected over Tanaka et al. 5,716,507 or Tanaka et al. 4,225,634. Neither Tanaka patent suggests the construction called for in claim 1. In fact, Fig. 5 of Tanaka '507 clearly shows that the balls 171 have not collapsed or deformed. They are also described specifically: "The diameter of the granulated particles 171 is approximately the same as the thickness of the porous film 17. Thus, numerous protrusion are formed on the surface of the porous film 17 by the granulated particles." It therefore seems clear that the particles 171 must have been calcined before incorporation into the film 17, and that they are not the same as the substantially spherical recesses formed by the spray-dried particles of the present invention. Nothing in either Tanaka patent suggests any way or any reason to form the recesses called for in claim 1.

A copy of the translation of non-US patent (Japan 4-95766) is enclosed, along with a copy of the Hackh's Chemical Dictionary entry. As soon as applicants' attorney locates his copies of the two cited articles, he will submit them.

Should the Examiner have suggestions or questions, he is urged to call applicants' undersigned attorney at 314-872-8118, extension 126.

Respectfully submitted,



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Part of #4

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANT: Mary R. Reidmeier, et al. ART UNIT: 1743

SERIAL NO.: 10/044,704 EXAMINER: TA HSUNG TUNG

FILED: NOVEMBER 9, 2001 DOCKET NO.: TOMC 8188US

FOR: CHEMICAL PLATING METHOD, ELECTROLYTIC CELL AND AUTOMOTIVE OXYGEN SENSOR USING IT

January 30, 2003

CLAIMS MARKED TO SHOW AMENDMENTS

1. (amended) A solid electrolyte cell comprising a solid electrolyte body having a first side and a second side, a first electrode on the first side of the body, the first side of the body having a porous surface of greater porosity than an underlying matrix of the body, the porous surface comprising a plurality of recesses including smaller recess and larger recesses, the larger recesses each being substantially spherical and having a small ball of solid electrolyte at its bottom, the first electrode substantially covering the first side of the body, the first electrode comprising a thin layer of conductive catalytic material extending into the larger and smaller recesses to mechanically lock the layer to the porous surface, and a second electrode on the second side of the body.